

[dividing a continuous ]segmenting a video stream into a plurality of [video ]scenes, each of said [video ]scenes comprising [one or more]at least one video frame[s including one key frame]; [and

further comprising at least one of the steps of:]

dividing, using intra-scene motion analysis, at least one of said plurality of scenes into [one or more layers]at least one scene foreground layer and a scene background layer;

[representing, as a mosaic, at least one of said pluraliy of scenes;

computing, for at least one layer or scene, one or more content-related appearance attributes; and

storing, in a database, said content-related appearance attributes or said mosaic representations]

representing each scene background layer as a mosaic, said background layer mosaic defining a key frame of a respective scene; and

representing each of said at least one video frames forming said scene as a difference between initial video frame imagery and a respective portion of said key frame.

2. (amended) The method of claim 1, further comprising the steps of:  
computing, for at least one of said scene foreground and background layers, one or more content-related appearance attributes; and  
storing, in a database, said scene content-related appearance attributes or said mosaic representations[wherein selected scenes are divided into a background layer and a foreground layer, and a mosaic representation of said selected scenes comprises a two dimensional mosaic representation].

3. (amended) The method of claim [1]2, further comprising the steps of  
storing representations of said plurality of scenes in a mass storage unit;  
and

retrieving, in response to a database query, scenes associated with

content-related appearance attributes defined in said database query.

4. (amended) The method of claim [2]1, wherein said mosaic representation comprises one of a two dimensional mosaic, a three dimensional mosaic and a network of mosaics

A<sup>1</sup> concl.  
5. (amended) The method if claim [1]2, wherein said step of computing a content-based appearance attribute for a layer of a scene comprises the steps of:  
generating an image pyramid of said layer;  
filtering, using one or more filters associated with said content-based appearance attribute, each subband of said image pyramid to produce respective one or more feature maps associated with each subband; and  
integrating said one or more feature maps associated with each respective subband to produce respective attribute pyramid subbands, wherein each of said attribute pyramid subbands comprises a content-based appearance attribute subband associated with a corresponding image pyramid subband.

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A<sup>2</sup>  
9. (amended) The method of claim [1]2, further comprising the step of:  
receiving a request for video information substantially matching a desired content-related appearance attribute; and  
retrieving video frames or scenes having at least one layer associated with content-related appearance attributes substantially matching said desired content-related appearance attribute.

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A<sup>3</sup>  
13. (amended) The method of claim 1[12], wherein said step of segmenting comprises the steps of:  
generating a descriptor vector of a predetermined type for each video frame of a video information stream;  
calculating a difference between descriptor vectors of successive frames;  
and

generating a scene cut indicium in response to said calculated difference exceeding a threshold level.

A3  
concl.  
14. (amended) The method of claim 1[12], wherein said step of segmenting comprises the steps of:

generating, in a first pass, a descriptor vector of a predetermined type for each video frame of a video information stream;

calculating, using said generated descriptor vectors, a descriptor vector threshold level;

calculating, in a second pass, a difference between descriptor vectors of successive frames; and

generating a scene cut indicium in response to said calculated difference exceeding a threshold level.

A4  
17. (amended) A method for browsing a video program stored in a mass storage unit, said video program comprising a plurality of [video] scenes, said [video] scenes comprising [at least a representative video frame]a plurality of video frames including a key frame comprising a mosaic of an intra-scene background layer, said method comprising the steps of:

providing a database associated with the stored video program, said database comprising attribute information associated with at least a representative portion of said plurality of video frames forming each scene[each of said representative video frames];

formulating a query utilizing attribute information associated with a desired video frame;

searching said database to identify video frames substantially satisfying said query; and

retrieving, from said mass storage unit, one or more of said identified video frames.

21. (amended) A computer-readable medium having stored thereon a plurality of

instructions, the plurality of instructions including instructions which, when executed by a processor, cause the processor to perform the steps of:

A<sup>5</sup> (a) [dividing a continuous segmenting a video stream into a plurality of [video ]scenes, each of said [video ]scenes comprising [one or more]at least one video frame[s including one key frame]; [and

further comprising at least one of the steps of:]

(b) dividing, using intra-scene motion analysis, at least one of said plurality of scenes into [one or more layers]at least one scene foreground layer and a scene background layer;

[(c) representing, as a mosaic, at least one of said plurality of scenes;

(d) computing, for at least one layer or scene, one or more content-related appearance attributes; and

(e) storing, in a database, said content-related appearance attributes or said mosaic representations]

representing each scene background layer as a mosaic, said background layer mosaic defining a key frame of a respective scene; and

representing each of said at least one video frames forming said scene as a difference between initial video frame imagery and a respective portion of said key frame.

Please ADD new claims 22-26 as follows:

A<sup>6</sup> --22. (newly added) The computer-readable medium of claim 21, further having stored thereon an additional plurality of instructions, the additional plurality of instructions including instructions which, when executed by a processor, cause the processor to perform the additional steps of:

computing, for at least one of said scene foreground and background layers, one or more content-related appearance attributes; and

storing, in a database, said scene content-related appearance attributes or said mosaic representations.

23. (newly added) The computer-readable medium of claim 22, further having stored thereon an additional plurality of instructions, the additional plurality of instructions including instructions which, when executed by a processor, cause the processor to perform the additional steps of:

storing representations of said plurality of scenes in a mass storage unit;  
and

retrieving, in response to a database query, scenes associated with content-related appearance attributes defined in said database query.

24. (newly added) The computer-readable medium of claim 22, wherein said mosaic representation comprises one of a two dimensional mosaic, a three dimensional mosaic and a network of mosaics

25. (newly added) The computer-readable medium of claim 22, wherein the stored instruction of computing a content-based appearance attribute for a layer of a scene, when executed by a processor, cause the processor to perform the steps of:

generating an image pyramid of said layer;

filtering, using one or more filters associated with said content-based appearance attribute, each subband of said image pyramid to produce respective one or more feature maps associated with each subband; and

integrating said one or more feature maps associated with each respective subband to produce respective attribute pyramid subbands, wherein each of said attribute pyramid subbands comprises a content-based appearance attribute subband associated with a corresponding image pyramid subband.

26. (newly added) The computer-readable medium of claim 25, wherein said